400 B.C. • Airborne lead from Roman smelters pollutes Northern Europe 1890s • Use of mercury drives hatters

beginning of sprawl in U.S. 1948 • Sulphur dioxide fog suffocates Donora, PA 1952 • "Killer Fog" claims 4,000

CLEAN AIR

"We all live downwind."

- 1980s Bumper Sticker

In the 1940's, the billowing smokestack was a symbol of America's strength, emblematic of the industrial might that would make the world "safe for democracy" and put a car in every garage.

The price was pollution. "It was our everyday life, and we just lived with it," recalls Donora, Pennsylvania volunteer fireman Bill Schempp. Corrosive yellow smoke billowed from the Donora Zinc Works 'round the clock. Thus, there was no alarm in October 1948, when a thermal inversion clamped a lid over the Monongahela Valley.

Street lights were on at noon, but the town still held its Halloween parade. At the annual homecoming game, people in the stands couldn't see the players on the field. Firemen groped their way from house to house carrying oxygen bottles: "It was terrible," Schempp remembers, "We'd give them a few shots of oxygen and then have to leave."

The Zinc Works did not shut down until Sunday morning. When rain finally broke the sulphur cloud Sunday night, 7,000 people - half the town's population - were ill. And twenty people had died.

Credit: Pittsburgh Post-Gazette

1948: Donora, PA at noon.

The suffocation of Donora shocked the nation and marked a turning point in our complacency about industrial pollution and its effect on health. States began to control air pollution, and in 1963, Congress passed the first federal Clean Air Act. This was amended in 1970 to give it teeth; states were required to put pollution reduction plans in place to meet federal clean air standards.

EPA set the standards, health-based limits for six common air pollutants - lead, nitrogen oxide, sulfur dioxide, carbon monoxide, particulate matter or soot, and ground-level ozone, commonly known as smog.

We sometimes smugly think of air pollution as a Los Angeles problem. But over Thanksgiving 1966, New York City found itself, as the *New York Times* front-paged it, "in a sea of smog." In addition to traffic, industry and power plants, many apartment buildings at the time were heated with coal and most had their own incinerators. All of the pollution became trapped beneath a temperature inversion.

A smog emergency was declared for the tri-state area. Motorists were urged to stay home. Incinerators were shut down. People wore

rs mad, with twitching and dementia 1943 • First smog episode in Los Angeles, CA 1945 • End of WWII triggers
0 lives in London, England 1955 • Air Pollution Control Act provides assistance to states 1956 • Interstate Highway

Photo Credit: Neal Boenzi/NYT Pictures

1966: New York City buried under a sea of smog.

hospital masks on the streets and it seemed that everyone was coughing. Health officials later attributed more than 150 deaths to the pollution.

The *Times* reported that "something called 'scrubbers' will soon be tried out (at a city incinerator)." Scrubbers, which pass exhaust through liquid or spray to capture pollutants, became common after passage of the 1970 Clean Air Act. Controlling industrial air pollution was immensely - and visibly - effective; since 1970 for example, emissions of soot particles have been cut nearly 80 percent.

Less visible, but equally insidious was the gaseous pollution tied to our cars. Vehicle emissions were the primary source of lead and major source of nitrogen oxides and organic compounds. EPA found problems - and opportunities to reduce pollution - in the car, at the gas station and in the fuel itself.

In cars, the greatest single advance was the introduction of the catalytic converter. The device completes the combustion process and significantly reduces emissions. The nozzle at the gas pump was redesigned and gas caps now have seals - preventing the loss of fuel vapors. The fuel itself was reformulated to burn cleaner.

There is no better demonstration of the connection between cars, air pollution and human health than the phase-out of leaded gasoline. Lead emissions have dropped 98 percent since the ban on leaded gasoline. Almost exactly paralleling the decline in airborne lead, lead levels in children's blood have dropped 75 percent. Lead, at even low levels, affects both intellectual and behavioral development in young children.

Another success story has been the reduction of health threats from carbon monoxide (CO) emissions. Carbon monoxide, known to aggravate heart disease, routinely exceeded protective levels. Emission controls on cars and other vehicles have reduced CO pollution to the point at which even in traffic-packed New York City, we now have no exceedances.

Relationship between lead in gasoline and mean blood lead levels NHANES II 1976-1980

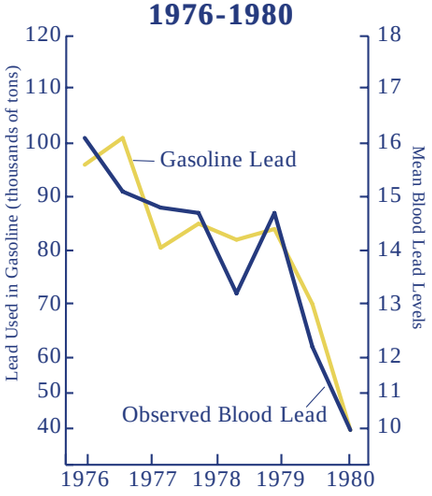

Chart Credit: Centers for Disease Control

Act fosters dependence on vehicular travel 1963 • Rachel Carson publishes "Silent Spring" 1967 • Federal Clean

20 million people celebrate first Earth Day • National Environmental Policy Act requires environmental impact

And then there's fuel economy. Gas mileage became doubly important in 1973 when oil producing nations severely cut exports. Average miles per

We Drive More, But Pollute Less

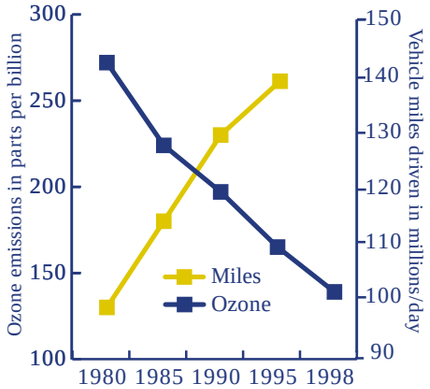

Chart Credit: C. Sebastian/EPA

gallon increased from under 16 mpg in 1975 to almost 26 mpg in 1987. Thanks to this, air quality today is significantly better, despite the fact that the number of cars on the road has doubled and the number of miles driven each year has grown even faster.

Those gains are at risk. Fully half the new vehicles sold in 1999 were sport utility vehicles (SUVs), minivans and pickups. SUVs produce three to five times as much pollution as the average passenger car. As a result, average fuel economy is starting to go down - with 1999 down 2.1 mpg from 1987.

In late 1999, President Clinton announced tough new emissions standards that will, for the first time, apply to pickups and SUVs, as well as cars. EPA estimates the new standards will reduce tailpipe emissions as much as 95 percent over the coming decade. EPA has also proposed new standards for truly tiny pollution particles that have been shown to be an even greater threat to human health, as well as new ozone standards to protect people from prolonged exposure to lower levels of smog.

For the public, a critical part of cutting auto emissions is the inspections necessary to ensure that the vehicle's pollution controls are working. Because ground-level ozone - smog - is a summertime problem in New Jersey and New York State, both states require enhanced vehicle inspection and maintenance. The payoff is public health protection; an estimated 10 to 20 percent of all respiratory-related hospital visits in the Northeast can be attributed to ozone pollution. There is an urgency to controlling ozone; despite all the progress in air quality, asthma rates continue to rise, and during the hot summer season, smog can trigger asthma attacks and worsen breathing problems.

EPA has also worked to reduce exposure to airborne toxic compounds such as benzene and mercury. One of the Agency's most important tools is also one of its simplest. The Toxics Release Inventory (TRI)

Maintaining your car helps keep our air clean.

requires companies to annually report the amount of toxic pollutants released to the environment. More than 600 toxic chemicals are listed. This is one list no one wants to top; the pressure of publicity has resulted in toxic emissions being cut by millions of pounds in the past decade. One company, Monsanto Chemical, cut its worldwide toxic emissions by 92 percent.

Diesels emit particulate pollution.